

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

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Be energy efficient!*

April 18, 2012

11-SD-76-L0.0/M2.9

11-2M3904

Project ID 1100020411

Addendum No. 1

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN SAN DIEGO COUNTY IN OCEANSIDE FROM 0.1 WEST OF ROUTE 5/76 SEPARATION TO MISSION AVENUE UNDERCROSSING.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Thursday, April 26, 2012, instead of the original date of Thursday, April 19, 2012.

This addendum is being issued to set a new bid opening date as shown herein and revise the Notice to Bidders and Special Provisions.

In the Special Provisions, Section 10-1.23, "RUBBERIZED BONDED WEARING COURSE-GAP GRADED," is revised as attached.

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the Notice to Bidders section of the Notice to Bidders and Special Provisions.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the Bid book.

Submit bids in the Bid book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

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11-2M3904
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To Bid book holders:

This addendum and attachment are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/11/11-2M3904

If you are not a Bid book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

A handwritten signature in black ink, appearing to read 'Laurie Berman', with a long horizontal flourish extending to the right.

LAURIE BERMAN
District Director

Attachment

10-1.23 RUBBERIZED BONDED WEARING COURSE – GAP GRADED

GENERAL

Summary

This work includes producing and placing bonded wearing course. Bonded wearing course consists of rubberized hot mix asphalt (gap graded) (RHMA-G) placed over a membrane of polymer modified asphaltic emulsion in a single pass with an integrated paving machine.

Comply with the specifications for RHMA-G under Section 39, "Hot Mix Asphalt," of the Standard Specifications. Use the Standard construction process.

Submittals

With the job mix formula (JMF) submittal, submit the target residual rate for asphaltic emulsion membrane.

Within 3 business days following the first delivery, submit test results for asphaltic emulsion properties performed on a sample taken from the asphaltic emulsion delivered. Test results must be from an AASHTO-accredited laboratory. Test results must comply with the table "Asphaltic Emulsion Membrane."

Within 1 business day of each job site delivery of asphaltic emulsion, submit to the Transportation Laboratory a 2-quart sample and a Certificate of Compliance in compliance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. Ship each sample so that it is received at the Transportation Laboratory within 48 hours of sampling. Label each asphaltic emulsion sampling container with:

1. Emulsion producer and location
2. Asphaltic emulsion type
3. Percent of water
4. Sampling location, time and date
5. Contract number
6. Resident Engineer

Each day bonded wearing course is placed, submit the residual and application rate for asphaltic emulsion membrane. During production, submit certified volume or weight slips for the materials supplied.

Quality Control and Assurance

Sample RHMA-G from either a truck or the material transfer device (MTV) hopper.

Perform sampling and testing at the specified frequency for the following additional quality characteristic:

Minimum Quality Control

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Specification	Sampling Location
Asphaltic emulsion membrane	Various	At least once per paving day	Specified in "Materials"	Delivery Truck
	ASTM D 2995		Submitted target application rate \pm 0.02 gallons per square yard	QC Plan At the job site

The Engineer samples and tests for the following additional quality characteristic for acceptance:

Acceptance

Quality Characteristic	Test Method	Specification	Sampling Location
Asphaltic emulsion membrane	Various	Specified in "Materials"	Delivery truck
	ASTM D 2995	Submitted target application rate \pm 0.01 gallons per square yard	At the job site

Sample asphaltic emulsion under AASHTO T 40. For each job site delivery of asphaltic emulsion, take a 2-quart sample in the presence of the Engineer. Take samples from the delivery truck mid-load from a sampling tap or thief. If the sample is taken from the tap, draw and discard 4 quarts before sampling.

If you unload asphalt binder or asphaltic emulsion into bulk storage tanks, do not use material from the tanks until you submit test results for a sample taken from the bulk storage tank performed by an AASHTO-accredited laboratory.

MATERIALS

Asphaltic Emulsion Membrane

Asphaltic emulsion for membrane must comply with:

Asphaltic Emulsion Membrane

Properties	Test Method	Specification	
		Min.	Max.
Saybolt-Furol viscosity, at 25 °C, s	AASHTO T59	20	100
Sieve test on original emulsion (at time of delivery), %		-	0.05
24-hour storage stability, %		-	1
Residue by evaporation, %	California Test 331	63	--
Tests on residue from evaporation test:			
Torsional recovery, measure entire arc of recovery, at 25 °C, %	California Test 332	40	--
Penetration (0.01 mm) at 25 °C	AASHTO T49		
If using PG 76-22 PM asphalt binder		50	150
If using PG 64-28 PM asphalt binder		70	200

Asphalt Binder

The grade of asphalt binder for the asphaltic emulsion membrane must be PG 64-28 PM.

The grade of asphalt binder mixed with aggregate for RHMA-G must be PG 64-16.

Aggregate

Aggregate for RHMA-G in bonded wearing course must comply with the 1/2-inch grading specified in the aggregate gradation tables.

Before the addition of asphalt binder and lime treatment, aggregate must comply with:

Aggregate Quality

Quality Characteristic	Test Method	Requirement
Percent of crushed particles	CT 205	
Coarse aggregate (% min.)		
Two fractured faces		90
Fine aggregate (% min.)	CT 211	
(Passing No. 4 sieve and retained on No. 8 sieve.)		
One fractured face		85
Los Angeles Rattler (% max.)	CT 211	
Loss at 100 Rev.		12
Loss at 500 Rev.		35
Sand equivalent ^a (min.)	CT 217	47
Fine aggregate angularity (% min.)	CT 234	45
Flat and elongated particles (% max. by weight @ 3:1)	CT 235	25

Note:

^a Reported value must be the average of 3 tests from a single sample.

Reclaimed Asphalt Pavement

Do not use reclaimed asphalt pavement in bonded wearing course.

HOT MIX ASPHALT DESIGN REQUIREMENTS

Asphalt Rubber Binder Content

Determine the amount of asphalt rubber binder to be mixed with the aggregate for RHMA-G under California Test 367 except:

1. Determine the specific gravity used in California Test 367, Section B, "Void Content of Specimen," using California Test 308, Method A.
2. California Test 367, Section C, "Optimum Bitumen Content," is revised as follows:
 - 2.1. Base the calculations on the average of 3 briquettes produced at each asphalt rubber binder content.
 - 2.2. Use California Test 309 to determine theoretical maximum specific gravity and density of the RHMA-G.
 - 2.3. Plot asphalt rubber binder content versus average air voids content based on California Test 309 for each set of three specimens on Form TL-306 (Figure 3), and connect adjacent points with a best-fit curve.
 - 2.4. Plot asphalt rubber binder content versus average Hveem stability for each set of three specimens and connect adjacent points with a best-fit curve.
 - 2.5. Calculate voids in mineral aggregate (VMA) and voids filled with asphalt (VFA) for each specimen, average each set, and plot the average versus asphalt rubber binder content.
 - 2.6. Calculate the dust proportion and plot versus asphalt rubber binder content.
 - 2.7. From the curve plotted in Step 2.3, select the theoretical asphalt rubber binder content that has 4.0 percent air voids.
 - 2.8. At the selected asphalt rubber binder content, evaluate corresponding voids in mineral aggregate, voids filled with asphalt, and dust proportion to verify compliance with requirements. If necessary, develop an alternate composite aggregate gradation to conform to the RHMA-G requirements.
 - 2.9. Record the asphalt rubber binder content in Step 2.7 as the Optimum Bitumen Content (OBC).
 - 2.10. To establish a recommended range, use the OBC as the high value and 0.3 percent less as the low value. Notwithstanding, the recommended range must not extend below 7.0 percent. If the OBC is 7.0 percent, then there is no recommended range, and 7.0 percent is the recommended value.
3. Laboratory mixing and compaction must comply with California Test 304 except the mixing temperature of the aggregate must be from 300 to 325 °F. The mixing temperature of the asphalt binder must be from 350 to 425 °F. The compaction temperature of the combined mixture must be from 290 to 300 °F.

CONSTRUCTION

Prepaving Conference

Attendance at the prepaving conference is mandatory for:

1. Emulsion supplier
2. Paving foreman
3. HMA supplier
4. Project superintendent
5. Project Manager

Storing

Do not store RHMA-G more than 8 hours.

Spreading and Compacting Equipment

Use an integrated distributor-paver capable of spraying the asphaltic emulsion membrane, spreading the RHMA-G, and leveling the mat surface in 1 pass.

Apply asphaltic emulsion membrane at a uniform rate for the full paving width. The asphaltic emulsion membrane must not be touched by any part of the paver including wheels or tracks.

If the spray bar is adjusted for changing pavement widths, the paver must prevent excess spraying of asphaltic emulsion beyond 2 inches of the RHMA-G edge.

Use a material transfer vehicle (MTV) to receive RHMA-G directly from the truck without dumping on the ground and deliver to the paver's receiving hopper or feed system. The MTV must:

1. Remix the HMA with augers before loading the paver
2. Have sufficient capacity to prevent stopping the paver

The paver must have a full-width, heated vibratory screed that uniformly spreads and finishes the RHMA-G.

Compact RHMA-G with steel-tired, 2-axle tandem rollers. Each roller must weigh from 126 to 172 pounds per linear inch of drum width.

Transporting, Spreading, and Compacting

Apply asphaltic emulsion membrane on dry or damp pavement with no free water. Apply asphaltic emulsion when the atmospheric and pavement temperatures are above 50 °F.

Before spreading RHMA-G, apply asphaltic emulsion membrane under Section 94, "Asphaltic Emulsions," of the Standard Specifications. Apply emulsion at a temperature from 120 to 180 F and in a single application at the residual rate specified for the condition of the underlying surface. Choose a target residual rate from the following:

Asphaltic Emulsion Membrane Target Residual Rate

Surface to Receive Asphaltic Emulsion Membrane	Target Residual Rates (gallons per square yard)
PCC pavement	0.09 - 0.11
Dense, compacted, new HMA pavement	0.11 - 0.14
Open textured, dry, aged or oxidized AC pavement	0.13 - 0.17

If you request and the Engineer authorizes, you may change the asphaltic emulsion membrane application rates.

Spread RHMA-G after applying asphaltic emulsion membrane and before the asphaltic emulsion membrane has spread beyond the area to be covered by the RHMA-G. Do not apply asphaltic emulsion membrane more than once.

Construct a transverse joint when RHMA-G remains in the paver for more than 30 minutes.

Do not reintroduce into the paving process RHMA-G spread over asphaltic emulsion membrane.

Do not overlap or hot lap RHMA-G. Pave through lanes after paving adjacent:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets
10. Ramps

For bonded wearing course placed on areas adjacent to through lanes that extend into the through lanes, cut the bonded wearing course to a neat, straight vertical line at the lane line.

If you spill asphaltic emulsion into the paver hopper, stop paving and remove and dispose of the contaminated material.

When measured on the surface immediately behind the screed, the RHMA-G must be at least 280 F and the temperature across the mat should not vary by more than 25 F. Do not take the temperature within 2 feet of the edge of the pavement.

For each paver used, compact RHMA-G with 2 coverages using 2 rollers with the vibrators turned off. Complete the first coverage before the surface temperature drops below 270 °F. Complete all compaction before the surface temperature drops below 200 °F.

If the atmospheric temperature is below 70 °F, cover loads in trucks with tarpaulins. The tarpaulins must completely cover the exposed load until you transfer the mixture to the MTV. You may omit tarpaulins if the time from discharge to truck until transfer to the MTV is less than 30 minutes.

Do not allow traffic on bonded wearing course until the surface temperature is below 160 °F.

Smoothness

If bonded wearing course is placed over HMA constructed under the same project:

1. The top layer of the HMA must comply with smoothness specifications before placing bonded wearing course.
2. Bonded wearing course must comply with straightedge and must-grind specifications.

For bonded wearing course placed over existing asphalt concrete, only the straightedge specifications for smoothness apply.

Remove and replace bonded wearing course not complying with the must-grind and straightedge specifications, except you may grind bonded wearing course for correcting smoothness:

1. At a transverse joint separating the bonded wearing course from pavement not constructed under the same project
2. Within 12 feet of a transverse joint separating the pavement from a bridge deck or approach slab

Rumble Strip

Construct rumble strip by grinding indentations.

Vertical Joints

Place bonded wearing course on adjacent traveled way lanes so that at the end of each work shift, the distance between the ends of bonded wearing course layers on adjacent lanes is from 5 to 10 feet. Place additional bonded wearing course along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional bonded wearing course to form temporary conforms. You may place Kraft paper or another approved bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.

Conform Tapers

Place shoulder conform tapers concurrently with the adjacent lane's paving.

MEASUREMENT AND PAYMENT

Bonded wearing course is paid for as Rubberized Hot Mix Asphalt (Bonded Wearing Course - Gap Graded) and Asphaltic Emulsion Membrane (Bonded Wearing Course). Rubberized Hot Mix Asphalt (Bonded Wearing Course - Gap Graded) is measured and paid for as specified in Section 39-5, "Measurement and Payment," of the Standard Specifications. Asphaltic Emulsion Membrane (Bonded Wearing Course) is measured as specified for asphaltic emulsion in Section 94, "Asphaltic Emulsions," of the Standard Specifications.

The contract price paid per ton for Asphaltic Emulsion Membrane (Bonded Wearing Course) includes full compensation for furnishing all labor, tools, materials, equipment and incidentals, and for doing all the work involved in asphaltic emulsion membrane, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.